

CLEAN COPY OF CLAIMS

Clean Copy of Pending Claims:

1. A method of improving synthesized speech quality in a speech coding system including an encoder and a decoder, said method comprising:
 - obtaining an input speech signal by said encoder;
 - coding said input speech signal by said encoder using a Code Excited Linear Prediction (CELP) coder to generate CELP coding parameters for synthesis of said input speech signal;
 - generating a plurality CELP speech frames by said encoder, each of said plurality CELP speech frames including said CELP coding parameters;
 - creating a plurality of voicing indexes by said encoder, wherein each of said plurality of voicing indexes relates to a characteristic of said input speech signal; and
 - transmitting each of said plurality of voicing indexes as part of each of said plurality of CELP speech frames by said encoder to said decoder for enhancing said synthesis of said input speech signal.
2. The method of claim 1, wherein at least one of said plurality of voicing indexes relates to a periodicity characteristic of said input speech signal.
3. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive highpass filter by said decoder.
4. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual

weighting filter by said decoder.

5. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window by said decoder.

6. The method of claim 1, wherein said at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook ~~of~~ by said decoder.

7. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a perceptual weighting filter by said decoder.

8. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a linear prediction coder by said decoder.

9. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a pitch enhancement fixed-codebook by said decoder.

10. The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for by controlling a post pitch enhancement by said decoder.

11. The method of claim 1, wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks.

12. A method of improving synthesized speech quality in a speech coding system including an encoder and a decoder, said method comprising:

receiving a plurality of Code Excited Linear Prediction (CELP) speech frames by said decoder from said encoder;

obtaining a plurality of CELP coding parameters by decoding each of said plurality of CELP speech frames by said decoder;

obtaining a plurality of voicing indexes by decoding each of said plurality of CELP speech frames by said decoder for use by said decoder for enhancing synthesis of said input speech signal, wherein each of said plurality of voicing indexes relates to a characteristic of said input speech signal; and

generating a synthesized version of said input speech signal using said plurality of CELP coding parameters and said plurality of voicing indexes by said decoder.

13. The method of claim 12, wherein at least one of said plurality of voicing indexes relates to a periodicity characteristic of said input speech signal.

14. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive highpass filter by said decoder.

15. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual weighting filter by said decoder.

16. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window for pitch contribution by said decoder.

17. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook by said decoder.

18. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a linear prediction coder filter by said decoder.

19. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a pitch enhancement fixed-codebook by said decoder.

20. The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a post pitch enhancement by said decoder.

21. The method of claim 12, wherein said decoder uses at least of said plurality of said voicing indexes selects at least one sub-codebook from a plurality of sub-codebooks.

22. An encoder for improving synthesized speech quality of an input speech signal, said encoder comprising:

a receiver configured to receive said input speech signal by said encoder;

a Code Excited Linear Prediction (CELP) coder configured to generating CELP coding parameters for synthesis of said input speech signal, configured to generate a plurality CELP speech frames, each of said plurality CELP speech frames including said CELP coding parameters, and further configured to create a plurality of voicing indexes relating to a characteristic of said input speech signal;

a transmitter configured to transmit each of said plurality of voicing indexes as part of each of said plurality of CELP speech frames by said encoder to a decoder for use in enhancing said synthesis of said input speech signal.

23. The encoder of claim 22, wherein at least one of said plurality of voicing indexes relates to a periodicity characteristic of said input speech signal.

24. The encoder of claim 22, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive highpass filter by said decoder.

25. The encoder of claim 22, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual weighting filter by said decoder.

26. The encoder of claim 22, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window by said decoder.

27. The encoder of claim 22, wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks.

28. A decoder for improving synthesized speech quality of an input speech signal, said method comprising:

a receiver configured to receive a plurality of Code Excited Linear Prediction (CELP) speech frames from an encoder based on said input speech signal,

wherein said decoder obtains a plurality of CELP coding parameters by decoding each of said plurality of CELP speech frames, and wherein said decoder obtains a plurality of voicing indexes by decoding each of said plurality of CELP speech frames, each of said plurality of voicing indexes relating to a characteristic of said input speech signal; wherein said decoder

generates a synthesized version of said input speech signal using said plurality of CELP coding parameters and said plurality of voicing indexes by said decoder.

29. The decoder of claim 28, wherein at least one of said plurality of voicing indexes relates to a periodicity characteristic of said input speech signal.

30. The decoder of claim 28, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive highpass filter by said decoder.

31. The decoder of claim 28, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual weighting filter by said decoder.

32. The decoder of claim 28, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window for pitch contribution by said decoder.

33. The decoder of claim 28, wherein said decoder uses at least of said plurality of said voicing indexes selects at least one sub-codebook from a plurality of sub-codebooks.

34. The method of claim 1, wherein each of said plurality of voicing indexes has a plurality of bits indicative of a classification of each frame of said plurality of CELP speech

frames.

35. The method of claim 34, wherein said plurality of bits are three bits.

36. The method of claim 34, wherein said classification is indicative of periodicity of said input speech signal.

37. The method of claim 12, wherein each of said plurality of voicing indexes has a plurality of bits indicative of a classification of each frame of said plurality of CELP speech frames.

38. The method of claim 37, wherein said plurality of bits are three bits.

39. The method of claim 37, wherein said classification is indicative of periodicity of said input speech signal.

40. The encoder of claim 22, wherein each of said plurality of voicing indexes has a plurality of bits indicative of a classification of each frame of said plurality of CELP speech frames.

41. The encoder of claim 40, wherein said plurality of bits are three bits.

42. The encoder of claim 40, wherein said classification is indicative of a noisy

speech signal.

43. The decoder of claim 28, wherein each of said plurality of voicing indexes has a plurality of bits indicative of a classification of each frame of said plurality of CELP speech frames.

44. The decoder of claim 40, wherein said classification is indicative of a periodic index.

45. The decoder of claim 40, wherein said periodic index ranges from a low periodic index to a high periodic index.